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Introduction

PRO AND ANTI

There is a current impression, both in and out of the cotton industry, that the Institute of Textile Technology is strictly pro-cotton.

If that were true, the word *cotton* should appear in the Institute's name. Conversely, the word should and does imply broader interests than chemistry or physics or engineering. Both words were chosen with particular care, and the Institute intends to live up to them.

Before undertaking to state precisely where ITT stands with respect to cotton and other fibers it may be well to define briefly the three planks in its platform of service to the textile industry.

1. *Education.* Fellowships will be granted to graduates of accredited schools giving thorough and basic undergraduate training in chemistry, chemical engineering and related subjects. The training at ITT will require two years for the M. S. degree and two additional years for the Ph. D.

This training will be fundamental in nature, designed the educate men as capable investigators, with emphasis on textiles but not with a view to producing superspecialists. Fellows will be instructed concerning other fibers than cotton, and some of them will undoubtedly select research problems relating to other fibers. Dissertations for the Ph. D. degree will not by any means be confined to cotton.

2. *Research.* Research at ITT may be fundamental or applied. It may be financed from the Institute's own funds, in which case it will belong to all the members, or it may be financed by a sponsor who will be the sole recipient and owner of the results.

A sponsor of a research project may be a single mill or company, or a group of mills or companies. Non-member mills are not eligible to sponsor research projects.

In its own research, including problems for M. S. and Ph. D. candidates, ITT must necessarily study other fibers. Thorough acquaintance with their competitive merits and demerits is important, thorough acquaintance with their potentialities for use with cotton fiber or on cotton mill machinery is essential.

Sponsors will not be confined to problems relating to cotton; any project showing promise of direct or indirect benefit to the textile industry may be brought in by any eligible sponsor.

3. *Library.* Adequate library resources and service are equally essential to the educational and research programs of ITT. Neither phase of the Institute's work could be carried on successfully without careful study of the published literature.

Beyond this, however, the library has been set up to serve member mills by keeping them currently informed of technical progress.

Since the library program underlies the work of staff and students, and many of the interests of member mills, the library cannot and does not neglect other fibers in its coverage of textile literature.

Now it is possible to say briefly where ITT stands with respect to textile fibers; it stands on this platform. If "procotton" implies being "anti" some other fiber, ITT is not a target for criticism.

It is true that ITT stands squarely for the cotton textile industry, but it stands for technical and economic progress, not for any one raw material. If progress means to bring in other fibers, ITT will help bring them in. If there is to be a new synthetic fiber, so cheap and good as to be a threat to cotton, ITT aims to be a prime mover in its discovery and development. The Institute has one *pro* and *anti;* it is *proadvancement* and *antistagnation.*

ABSTRACTS

NOTE: Periodical articles and patents covered in "Textile Technology Digest" are abstracted elsewhere, but not all in the same publication. These abstracts are not intended to compete with any other source, but to supplement other sources for two specific purposes:

1. To bring together the pertinent references in a form adapted to rapid scanning, abstracts being selected and written to meet the interests (broadly interpreted) of member mills.
2. To present the information concisely, in sufficient detail to provide a survey of progress in any branch of the industry or to help readers decide whether they need to consult the original reference.

No attempt is made to include operating details or other information needed for following up a new development. Tailoring the abstracts to fit the needs of cotton textile technologists is the primary purpose. The layout and arrangement are intended for easy reading, rapid scanning and ready finding of pertinent items. Abstracts may be clipped for mounting on index cards (an extra copy for this purpose will be supplied on request), or whole issues may be filed in a standard 3-ring binder.

The rudimentary classification employed here will be expanded as the abstracts increase in number and variety.

There will be restricted circulation of "Textile Technology Digest" to selected schools, libraries and other recipients who are not members of the Institute of Textile Technology. Suggestions are invited from readers, whether members or not.

ANALYSIS

MERCURY DETERMINATION. D. A. Shiraeff, General Dyestuff Corp. *Am. Dyestuff Reporter 33,* P312, P315 (1944). Mercury in fabrics mildewproofed with organo-mercurials can be determined rapidly and accurately, without special apparatus or use of dangerous chemicals, by titrating with dithizone solution.

BLEACHING

OPEN-WIDTH BLEACHING. D. J. Campbell, E. I. du Pont de Nemours & Co. *Am. Wool & Cotton Reporter 68,* No. 30, 35 (1944). Economies effected by the new du Pont process for continuous bleaching vary with varying conditions; in some cases the saving reaches 40%, chiefly in steam and chemicals. Production is increased at the same time. The layout is shown in a drawing.

MIXED BLEACH. Clifford A. Hampel (to Mathieson Alkali Works, Inc.) USP 2 353 823, July 18, 1944. Bleaching cellulose fibers or materials in an aqueous solution of an alkali (or alkaline earth) metal hypochlorite and an alkali (or alkaline earth) metal persulfate. The solution may be acid (pH 3-7) neutral (pH 7) or alkaline (pH 7-11).

CARDING

CARDING COMPLEX BLENDS. Wm. Calkins. *Textile Age 8,* No. 6, 74, 76, 78 (1944). Equipment is described for carding blends, e. g., of viscose silk with wool tops or Aralac, or with Aralac and acetate silk, etc.

CELLULOSE

CELLULOSE POWDER. Julius Kent (to Kent Chemical Corp.). USP 2 353 243, July 11, 1944. Highly absorptive antiseptic powder is made by steeping cellulose in a solution of orthoboric acid, drying at 80-140°C. and grinding to powder.

CELLULOSE DERIVATIVES

CHEMICALS. Anon. *Chem. Met. Eng. 51,* No. 7, 97-9 (1944). A market analysis is presented to show the probable effects of modern progress in making rayon and cellulose plastics on the demand for acids, alkalies, solvents and other chemicals.

NITRATING CELLULOSE. G. L. Wilson and F. D. Miles, Nobel Laboratories. *Trans. Faraday Soc. 40,* 150-63 (1944). When ramie cellulose is nitrated with nitric acid vapor at 4-16 mm. pressure and 20-40°C. for periods up to 40 hours the results indicate that the nitration rate and absorption of N oxide molecules on the cellulose fiber reach a maximum at about the same time, and that rate of nitration is roughly proportional to the square of the amount absorbed. Nitrocelluloses ranging up to 13.4% N are obtained: they have exceptionally high solubility in acetone.

CHEMICALS

SULFATED ALCOHOLS. E. E. Dreger, G. I. Keim, G. D. Miles, Leo Shedlovsky and John Ross (Colgate-Palmolive-Peet Co.) *Ind. Eng. Chem.* 36, 610-7 (1944). The influence of molecular weight and structure on surface activity of Na salts of sulfated long chain alcohols has been studied by comparing their surface tension and foaming, wetting and detersive properties in water and in aqueous solutions of other electrolytes. The source compounds were straight chain (sulfated in various positions) and secondary alcohols with 11, 13, 15, 17 and 19 C atoms.

DYEING

DYEING MACHINE. Alexander J. Belokopytoff (to Paul N. Robins). USP 2 352 882, July 4, 1944. A dyeing machine has an endless belt covered with a gelatinous coating and sprinkled with dye solution, which is then scraped and stirred to distribute the dye in irregular patterns.

FAST DYEINGS. Erich Fischer, Werner Kirst and Walter Gmelin (to General Aniline & Film Corp.) USP 2 353 701, July 4, 1944. Forming fast azo dyes on the fiber from an isocyclic or heterocyclic amine which may also have at least 1 OH group, but no group which forms metal complexes; and treating the dyed fabric, first with alkali and then with a reagent yielding a metal complex.

FABRICS

CLOTH DYED FABRICS. Anon. *Am. Wool & Cotton Reporter, 68,* No. 27, 7-9, 34 (1944). Cloth dyed blends containing viscose or viscose-acetate in the warp and viscose-acetate yarn in the filling are discussed with respect to arrangement of the yarns and dyeing.

ACETATE SHARKSKIN. Anon. *Am. Wool & Cotton Reporter 68,* No. 29, 7-8, 37 (1944). A flexible acetate sharkskin fabric weighing about 8 oz. per yard is described. The filling is acetate silk. Twist details and layouts are described for making this fabric.

WORSTED AND WOOLENS. Anon. *Am. Wool & Cotton Reporter 68, No.* 29, 9-10 (1944). Problems involved in producing wool fabrics as such or as blends on cotton mill machinery are discussed. Roller clearer cards and other new equipment are used for this purpose. Static electricity is a problem.

BONDING AGENTS. Anon. *Am. Wool & Cotton Reporter 68,* No. 30, 25-6 (1944). New finishing processes are reported which are covered by three basic patents owned by the Riverside and Dan River Mills. These patents represent inventions of F. E. Bartell and H. Y. Jenning. They introduce improvements in abrasion resistance, tensile strength bonding of pigments and other fabric properties.

BLANKETS. Robert Amory, Nashua Mfg Co. *Rayon Textile Monthly 25,* 337-8 (1944); Am. Wool & Cotton Reporter 68, No. 26, 7-8, 18 (1944), Airpermeability of blankets is essential to comfort and health, but must not be too great. Wool blended with cotton, and native Asiatic cotton (thicker and curlier than cottons of American origin) blended with wool are among the preferred blanket fabrics. Many properties of blankets are also adaptable to garment fabrics.

STRENGTH OF SHEETING. C. E. Morrell, Pepperell Mfg. Co. *Am. Dyestuff Reporter 33,* P320-1—(1944). The tendering effect of acid on warp and filling threads was measured by tests on the Scott inclined plane Serigraph. Samples were treated with sulfuric acid in 34 concentrations from 0.01 to 1%. The loss in tensile strength of sheeting, after peroxide bleaching and double washing, ranged from 2.15 to 99.82% in the warp and 1.87 to 99.91% in the filling.

BLENDING. A. C. Roberts. *Textile Age 8,* No. 6, 32, 34, 36, 38, 42, 47 (1944). Blending behavior is discussed with respect to ramie, nylon, Aralac (casein wool), soy protein fiber and Palconia (from redwood bark) in mixtures with wool, cotton and other fibers.

BLANKETS. Herbert F. Schiefer, Hazel T. Stevens, Pauline B. Mack and Paul M. Boyland. *J. Research Nat'l Bur. Standards 32,* 261-84 (1944). Performance characteristics of blankets were studied in relation to fiber composition, weight, thickness, compressibility, heat transmission, air permeability, strength and shrinkage. Quality standards are proposed.

LIGHT FASTNESS. C. A. Seibert and C. A. Sylvester, E. I. du Pont Nemours & Co. *Am. Dyestuff Reporter 33,* P311-2 (1944). The pH value of dyed fabrics has some influence on light fastness but no demonstrable effect on chlorine fastness. Alkalinity (pH above 7) is observed in numerous cases of impaired light fastness. Buffering of the finishing bath may be helpful.

KNIT FABRIC. Stanley R. Shelmire and Paul Cooper (to Scott & Williams, Inc.), USP 2 353 090, July 4, 1944. Threads which differ in stiffness and resilience are combined in a knit fabric by knitting alternately in groups of 1 to 3 courses with like groups of more pliable thread, imparting unidirectional elasticity to the fabric.

ELASTIC FABRIC. Merwyn C. Teague (to U. S. Rubber Co.). USP 2 353 525, July 11, 1944. Elastic fabric is made by laminating a fabric with grainless rubber deposited from an aqueous dispersion, the bonding agent being vulcanized rubber.

POLISHING CLOTH. Harold C. Weber. USP 2 353 978, July 18, 1944. A polishing cloth which also has an antifogging effect is made by impregnating a lintless fabric with a neutralized sulfated long chain (12-18C) alcohol.

FIBERS

ABACA AND FLAX. A. C. Whitford, *Textile Age, 8,* No. 6, 58, 60, 62, 64 (1944). Abaca (or Manila hemp, though not a hemp) comes from a wild banana plant. Phormium (New Zealand flax, though not a flax) belongs to the lily family. Both yield coarse fibers having many potential uses.

RAMIE. Rank A. Svoboda and Allen Skolnik. USP 2 353 947, July 18, 1944. Ramie stalks are decorticated and the fiber is boiled 45-60 minutes in water containing (per 100 lb. of fiber) 20-30 lb. NaOH, 12 oz. NH_4Cl, 12 oz. $(NH_4)_2CO_3$ and 2.5 lb. soap. The treated fiber is washed, soaked in strong (20-25%) aqueous NaOH for 2-10 hours, washed and dried.

FINISHING

PROCESS DEVELOPMENTS. Anon. *Am. Wool & Cotton Reporter 63,* No. 30, 22-24 (1944). Recent developments in cotton processing include flameproofing, creaseproofing and a variety of effects produced through the aid of synthetic resins or plastics. War-time necessities have also brought out improvements in printing, dyeing and bleaching.

NEW FINISHES. Anon. *Am. Wool & Cotton Reporter 68,* No. 30, 27, 29, 31, 33 (1944). Problems involved in applying the newer synthetic finishes to various fibers and fabrics are discussed.

RESIN FINISHES. F. P. Brennan, U. S. Testing Co.. *Rayon Textile Monthly* 25, 339-41 (1944). Methods are described for identifying urea-formaldehyde, alkyd and polyethene type resin finishes, and cellulose ester or ether finishes, on fabrics. Advance in the field of synthetic finishes has been so rapid that much research on analytical methods is needed.

GARMENTS

STOCKING MARKER. Bernard I. Blickman. USP 2 353 291, July 11, 1944. A dye-carrying filament is used to mark an imitation seam on the backs of stocking legs.

INSTRUMENTS

NEW EQUIPMENT. Anon. *Rayon Textile Monthly 25,* 356 (1944). Illustrated descriptions of a sonic tester for measuring elasticity of yarn; the Rota-Sight flowmeter, and an x-ray diffraction unit for studies of fiber structure.

INSTRUMENTATION. W. B. Heinz and W. W. Starke, Cochrane Corp. and Frostmann Woolen Co. *Mech. Eng. 66,* 451-5 (1944). Objectives of instrumentation in typical textile operations are tabulated and instruments for the various objectives are discussed.

KNITTING

KNITTING MACHINE. Herbert N. and Elizabeth E. Smith. USP 2 353 197, July 11, 1944. A machine having a guard and a device which holds open a stitch passing around it, then loops it through the old stitch still held open by the guard.

DRAW MECHANISM. Arthur Shortland (to Nellor Bromley & Co., Ltd.) USP 2 353 973, July 18, 1944. A draw mechanism for knitting machines has an oscillating draw cam and a follower moving on a cam track with the follower connected to the reciprocating member. The track can be modified to vary the amplitude of the reciprocating member.

MACHINES

MACHINES AND PROCESSES. Anon. *Am. Wool & Cotton Reporter 68,* No. 28, 7, 36 (1944). Suggestions are presented for proper maintenance and operation of drawing frames in rayon and cotton mills.

MOTOR MAINTENANCE. Anon. *Rayon Textile Monthly 25,* 347-9 (1944). Textile mills, as large users of motors, can do much to conserve the supply by proper maintenance and care. Motors for spinning frames, dry twisters, roving frames and other textile machines are illustrated and discussed in relation to symptoms of motor faults, fire hazards and other maintenance factors.

NEW MACHINERY. Anon. *Rayon Textile Monthly 25,* 355-7 (1944). Illustrated descriptions of the Zenith spinning pump for rayon tire cord yarn; Walker stainless steel heddles; Proctor automatic card feed; Rodney Hunt lightweight winder rolls; a power brush reed cleaner; a spray gun metallizer and a stabilized traveling platform.

ENGINEERING AND MACHINES. Nathaniel M. Mitchell, Barnes Textile Associates. *Rayon Textile Monthly 25,* 350-2 (1944.) Sound engineering practice tends toward maximum output per man and per machine. Some modern developments and probable future trends in textile machinery are discussed.

BOBBIN TRANSFER. Jos. Stuer. USP 2 353 323, July 11, 1944. An improved bobbin transfer device for looms with stationary magazines has cradle actuating slides, each held by a spring in bobbin-receiving position.

STOP DEVICE. Floribert H. Tetrean. USP 2 353 324, July 11, 1934. An improved stop device for looms having a harness frame and harness straps.

LOOM. Walter Price. USP 2 353 415, July 11, 1944. A loom support has a shuttle moving across a lay, and at least 3 superposed shuttle-boxes having 3 vertical positions at the end of the day.

ROLL COVER. Henry H. Harkins (to U. S. Rubber Co.). USP 2 353 462, July 11, 1944. Covering textile drawing and feed rolls with a synthetic rubber derived from butadiene and acrylonitrile.

LOOM FEELER. Arthur E. Benson. USP 2 353 540, July 11, 1944. An improved feeler mechanism has the feeler resiliently mounted in a casing from the wall of which a stiff rod portion of the feeler projects.

SHUTTLE. Harry E. Foster (to Draper Corp.). USP 2 353 611, July 11, 1944. An automatically threading loom shuttle is designed to prevent the filling thread from rising out of the side delivery eye.

TUFTING FRAME. Jas. A. Bishop. USP 2 353 640, July 18, 1944. In a tufting frame for use in making tufted rugs the base and side walls form parallel grooves to receive strands of yarn. The side walls and a grooved tongue extending above them have transverse slots, wide enough to receive cutting shears and spaced according to tuft length. Shallower, narrower slots are provided for single strands of yarn.

WINDER. Cyril M. Croft, Alvin W. Bergeron and Frederick G. Dodge (to Celanese Corp. of America). USP 2 353 653, July 18, 1944. Fabrics are wound on a roll by a device having positive feed and an oscillating guide roll which is rotated by the moving fabric.

YARN WINDER. Wm. V. Henry (to American Enka Corp.). USP 2 353 667, July 18, 1944. The spool of a winder for textile strands has a receiving ring with a concave inner wall at one end and a spindle to which a spring key is attached, for frictional engagement with the concave inner wall of the receiving ring.

COTTON COMBER. Frank L. Crockett (to Whitin Machine Works) USP 2 353 812, July 18, 1944. A nipper for cotton combers has a lap-feed roll and cushion plate swinging on supports pivoted above the comb cylinder, with a lap roll and creel roller arranged to feed lap directly down to the cushion plate.

MATERIALS

PROCESS WATER. Lewis B. Miller, W. H. and L. D. Betz Co. *Cotton 108,* No. 7, 85-8, 132-3 (1944). Hardness, color, bacterial count, iron content and other properties must be considered in selecting or conditioning water for steam boilers and for humidification, bleaching, dyeing, mercerizing and other textile operations. A tentative specification for textile process water is presented.

PESTS

RESISTANCE TO PESTS. J. Robert Bonner, General Dyestuff Corp. *Am. Dyestuff Reporter 33,* P266-9 (1944). Cooperative tests with black carpet beetles and webbing clothes moths are reported for broadcloth, men's suiting, dress goods, carpets, knitting and carpet yarns, blankets, hat felt and sweaters.

PRINTING

PIECE GOODS. Arthur E. Hirst, Standard Chemical Products, Ind. *Cotton 108,* No. 6, 97-100 (1944). Equipment for finishing piece goods after printing is described, with illustrations of a photoelectric filling straightener on a cloth tenter; a starching range; a calender and a decater.

PIGMENT PRINTING. Olive-Sue Linkletter, Aridye Corp. *Rayon Textile Monthly 25,* 342 (1944); *Am. Wool & Cotton Reporter 68, No.* 30, 41, 43, 45 (1944). Pigment printing offers good uniformity of shade and high sun fastness. The method was first applied to dress goods and shirtings but has been successfully extended to synthetic fibers. Resin emulsion vehicles have several advantages.

PRINTING PASTE. Chas. F. Miller (to E. I. du Pont de Nemours & Co.). USP 2 353 411. July 11, 1944. Printing textiles from a paste containing the selected dye, a water-soluble salt of Fe or other metal, and triethanolamine.

PROCESSING

STRETCH AFTER FULLING. Anon. *Am. Wool & Cotton Reporter 68,* No. 30, 47, 49 (1944). The stretch imparted to dyed fabrics during fulling and finishing operations must be duly considered. The width to which the goods are fulled is a major factor in amount of stretch. High grade stocks shrink and felt sufficiently to offset excessive stretching; their stretch can be estimated quite accurately.

CARBONIZING. Anon. *Am. Wool & Cotton Reporter 68, No.* 30, 51, 53 (1944). The sulfuric acid, chrome gas and aluminum chloride methods are compared as applied to separating cotton from wool in reworking fabrics into shoddy, or removing cellulosic fibers or fragments from raw wool.

SYNTHETIC STAPLE FIBER. Bill McComb. *Rayon Textile Monthly 25,* 336-17 (1944). In processing long fibers adequate parallelizing can be effected on cotton mill drawing rolls if the optimum spreads and roll settings are first ascertained, and if smoothness and other factors are duly considered in changing the drawing from cotton to staple fiber.

SIZING NYLON. Jas. P. Ransom. *Cotton 108,* No. 6, 93-6, 126; No. 7, 95-7, 136 (1944). Problems encountered in single-end sizing of nylon yarn are discussed, with special reference to the feed system for sizing machine troughs, and maintenance of size solutions in proper condition. An aqueous solution of polyvinyl alcohol, viscosity about 130 Saybolt, is employed. Coning methods are also described.

RESEARCH

TEXTILE RESEARCH. Malcolm E. Campbell, North Carolina State College. *Textile Bull. 66,* No. 9, 11-12, 14, 39 (1944); *Am. Dyestuff Reporter 33,* P313-5 (1944). The place of textile schools in the expanding research activities of the industry is discussed, with specific reference to the program of the textile school at North Carolina State College.

SOUTHERN RESEARCH INSTITUTE. Thos. W. Martin. *Manufacturer's Record 131.* No. 7, 24-25, 58 (1944). The Southern (formerly Alabama) Research Institute in Birmingham is set up on the Mellon Institute plan to conduct applied research on any problems of interest in the South. Problems in pure research will probably be allotted to universities.

TEXTILE CHEMICAL RESEARCH. C. B. Ordway. *Textile Bull 66,* No. 9, 16, 36 (1944). Northern textile schools have given relatively more attention to textile chemistry in their research programs; southern schools relatively more to textile engineering. Suggestions are given for improving chemical research programs.

LABORATORY TO MARKET. Jackson A. Woodruff, Am. Vicose Corp. *Rayon Textile Monthly 25,* 319 (1944). The functions of a laboratory for carrying research products through the stage of development into marketable goods include standardization, testing, pattern work, study of methods for use of customers, and development work.

ROVING

RAYON BLENDS. Anon. *Rayon Textile Monthly 25,* 335 (1944). Production of rayon staple and rayon blends on cotton mill machinery calls for special roving equipment such as the Whitin Super-Draft roving frame.

HOOK BOLSTERS. Jas. T. Meador. *Textile Bull. 66,* No. 9, 29 (1944). A method for reclaiming hook bolsters of roving machines is described and illustrated. It requires only the usual machine shop equipment possessed by the average cotton mill.

SPECTROMETRY

INFRARED SPECTRA. H. W. Thompson. *J. Chem. Soc. 1944,* 183-92. Infrared absorption spectra offer many opportunities for study of molecular forces and properties. A variety of problems relating to high polymers such as vinyl resins, synthetic rubber and cellulose can be explored by infrared measurements, but the method has limitations which should be clearly understood before undertaking an investigation.

TESTING

ULTRAVIOLET LAMPS. J. A. Radley, Imperial Chemical Industries Ltd. *J. Soc. Dyers Colourists 60,* 114-9 (1944). Lamps for fluorescence testing or analysis of dyes, fibers and fabrics include the Osglim, Osfra, Mercra, Hanovia (arc and fluorescent types), Vi-Tan and other lamps. Some of them are low pressure ionized gas lamps. For most purposes in textile laboratories ordinary heat-resisting Wood's glass filters are adequate for screening out unwanted wave lengths.

RECORDING SPECTROPHOTOMETER. F. T. Simon, Sidney Blumenthal & Co. *Am. Dyestuff Reporter 33,* P270-1 (1944). Uniform dyeing of automobile upholstery cloth has been achieved with the aid of exact color measurement, using a recording spectrophotometer.

TWISTING

STRAND TWISTER. Albert E. Winslow (to Mystic Machine Co.). USP 2 353 101-2-3-4-5, July 4, 1944. A strand twister has a spindle which carries a flyer in which a shaft is mounted to revolve around the spindle, and annular races in pairs, one on the shaft and one on the supply package support.

WEAVING

WARP PREPARATION. Frank Kaufmann, Steel Heddle Mfg. Co. *Rayon Textile Monthly 25,* 331-3 (1944). Combs and reeds used in warp preparation are classified and illustrated. Performance characteristics are discussed.

REPAIRING REEDS. H. E. Wenrich. *Rayon Textile Monthly 25,* 333-4 (1944). A small electric hand tool is much better than hand rubbing for removing blemishes from reeds. There are several methods for cleaning rusty reeds, but use of stainless steel or other corrosion-resisting metal is preferable.

SHUTTLE CONTROL. Augustin J. Chevrette (to Crompton & Knowles Loom Work) USP 2 352 770, July 4, 1944. An improved shuttle-changing loom has a stack of reserve shuttles, a shuttle box and a device for positioning the shuttle

SWEEPSTICK. Frank L. Furgal. USP 2 353 302, July 11, 1944. An improved sweepstick for looms is made of laminated leather strips.

WARP STOP. Jas. H. Burgess and Garrett W. Fender. USP 2 353 644. July 18, 1944. The detector bar of a mechanical warp stop motion is arranged for reciprocal motion in a groove in its holder and is serrated along its bottom edge so that lint and dirt are moved along the bar and discharged at the end. The bar and holder have toothed upper edges, with flat spaces between the teeth; individual teeth have the shape of a right triangle and are arranged and spaced to engage a drop wire when it falls.

PILE LOOPER. Emil R. Pedrazzo. USP 2 353 968, July 18, 1944. A loom attachment for forming terry pile loops has a sliding carriage for a bar which moves laterally with respect to the carriage and forms loops in individual upper threads of the warp shed.

YARNS

VINYON. Frederic Bonnet, Am. Viscose Corp. *Rayon Textile Monthly 25,* 318 (1944). Vinyon yarn, with tensile strength 1-4 g/denier and elongation 12-14%, is particularly characterized by high resistance to acids, alkalies, water and many organic liquids. It is useful in fishing lines or nets, filter cloth for severe chemical service, elastic yarns and other products.

TWIST. S. L. Gerhard, U. S. Rubber Co. *J. Applied Physics 15,* 474-6 (1944). Conventional uses of the multiple twist formula can be extended to copying a familiar yarn in another yarn of entirely different material. This is accomplished by applying the concept of relative density, since yarns of different materials but the same relative density can be handled in the same way. Mathematical relations between certain geometric properties of yarns are used to derive the concept of relative density.